

## **REMARKS**

No claims have been amended herein. Claims 1-15 remain pending in the captioned case. Further examination and reconsideration of the presently claimed application are respectfully requested.

### **Allowable Subject Matter**

Applicant sincerely appreciates the Examiner's recognition of the patentable subject matter recited in claims 3-6 and 9-15. However, as set forth in more detail below, Applicant believes the pending claims are patentably distinct over the art of record in their present form. In addition, the Office Action states some reasons for the allowance of claims 3-6 and 9-15 on page 3 of the Office Action. Applicant asserts that it is the combination of features in these claims that render the claims distinguishable over the cited art, not just the portions of the claims cited in the Office Action.

### **Section 103 Rejection**

Claims 1, 2, 7, and 8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application No. 2005/0041624 to Hui et al. (hereinafter "Hui") in view of U.S. Patent No. 6,624,536 to Sawada et al. (hereinafter "Sawada"). Applicant respectfully traverse this rejection. To establish a case of *prima facie* obviousness of a claimed invention, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Second, there must be a reasonable expectation of success. As stated in MPEP 2143.01, the fact that references can be hypothetically combined or modified is not sufficient to establish a *prima facie* case of obviousness. See *In re Mills*, 916 F.2d. 680 (Fed. Cir. 1990). Finally, the prior art references must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d. 981 (CCPA 1974); MPEP 2143.03 (emphasis added). Specifically, "all words in a claim must be considered when judging the patentability of that claim against the prior art." *In re Wilson* 424 F.2d. 1382 (CCPA 1970). Using these standards, Applicants contend (i) that the hypothetically combined cited art fails to teach or suggest all features of the currently pending claims; and (ii) that the references cannot be modified to read upon the present limitations, since there is no impetus or motivation described in those

references to form the necessary modification. Several distinctive features of the present invention are set forth in more detail below.

**Hui and Sawada each fail to disclose an apparatus positioned proximate to a second antenna for intercepting electromagnetic energy radiated from a first antenna during transmission of a signal, wherein the apparatus includes a plurality of resonant circuit elements, each configured to resonate at or near a carrier frequency of the transmitted signal for redirecting at least a portion of the electromagnetic energy away from the second antenna, thereby reducing the electromagnetic interference at the second antenna.** Originally filed claim 1 recites:

An apparatus for reducing electromagnetic interference between a pair of antennas attached to a wireless communications device, wherein the apparatus is positioned proximate to a second antenna of the pair of antennas for intercepting electromagnetic energy radiated from a first antenna of the pair of antennas during transmission of a signal, and wherein the apparatus comprises a plurality of resonant circuit elements, each being configured to resonate at or near a carrier frequency of the transmitted signal for redirecting at least a portion of the electromagnetic energy away from the second antenna, thereby reducing the electromagnetic interference at the second antenna.

Statements in the Office Action suggest that Hui “teaches an apparatus for reducing electromagnetic interference between a pair of antennas (e.g., components 920 and 1010) attached to a wireless communications device, wherein the apparatus is positioned proximate to a second antenna of the pair of antennas for intercepting electromagnetic energy radiated from a first antenna of the pair of antennas during transmission of a signal (see figures 8 and 11, paragraphs [0069], [0072], [0080]).” (Office Action, page 2).

In light of the above statements, it appears that the Examiner considers the firewall (e.g., firewall 1020 of FIG. 11) disclosed by Hui to be somewhat equivalent to the presently claimed “apparatus”. Although Hui teaches that the firewall may be formed between two antennas (e.g., antennas 920 and 1010 of FIG. 11) to “mitigate” coupling there between, Hui does not teach or suggest that the firewall includes a plurality of resonant circuit elements configured for intercepting electromagnetic (EM) energy radiated from a first antenna and for redirecting the EM energy away from a second antenna. Further statements in the Office Action appear to agree with the Applicant. For example, the Examiner admits that “Hui et al. does not clearly teach that the apparatus comprises a plurality of resonant circuit elements, each being

configured to resonate at or near a carrier frequency of the transmitted signal for redirecting at least a portion [of] the electromagnetic energy away from the second antenna, thereby reducing the electromagnetic interference at the second antenna." (Office Action, page 2).

However, the Examiner suggests that "the preceding limitation is taught in Sawada et al. (see column 5, lines 19-41)," and therefore, one skilled in the art would find it obvious to apply the teachings of Sawada to those of Hui to improve the capability of the apparatus by absorbing the electromagnetic waves located within an arbitrary wavelength range. See, Office Action, page 2. The Applicants disagree with the proposed combination, for at least the reasons set forth in more detail below.

First of all, Sawada fails to disclose the limitation for which the reference is relied upon. In other words, like Hui, Sawada fails to disclose an apparatus including a plurality of resonant circuit elements, which are configured for: (a) intercepting electromagnetic energy radiated from a first antenna during transmission of a signal, and (b) resonating at or near a carrier frequency of the transmitted signal for redirecting at least a portion of the electromagnetic energy away from a second antenna, thereby reducing electromagnetic interference (EMI) at the second antenna.

Instead of intercepting and redirecting the radiated electromagnetic energy, the invention of Sawada reduces EMI by using an electromagnetic wave absorbing device (e.g., 60, FIG. 1) to absorb the harmful electromagnetic waves generated by a source. As shown in FIG. 1, the electromagnetic wave absorbing device (60) of Sawada may include "a plurality of dipole antennas 62 [which] are connected to both ends of a real resistor 61" (Sawada, column 5, lines 13-22). When the electromagnetic wave absorbing device is positioned within an electromagnetic wave to be absorbed, the plurality of "dipole antennas 62 are resonated with this electromagnetic wave, so that a high frequency current is induced." (Sawada, column 5, lines 27-31). The high frequency current is then passed through the real resistor (61) to completely dissipate the high frequency current in the form of thermal energy. This enables the electromagnetic wave absorbing device (60) to effectively absorb the electromagnetic wave, thereby causing the electromagnetic wave to disappear. See, Sawada, column 5, lines 31-41. In most cases, Sawada positions the electromagnetic wave absorbing device on (or near) the source responsible for generating the harmful electromagnetic wave, so that the wave

absorbing device "can suppress radiations of the harmful electromagnetic wave and the higher harmonic waves thereof ... to reduce the EMI" (see, Sawada, column 5, lines 42-51).

The electromagnetic wave absorbing device of Sawada is altogether different from the presently claimed apparatus. For example, the electromagnetic wave absorbing device disclosed by Sawada reduces EMI by absorbing electromagnetic energy, instead of redirecting the electromagnetic energy, as presently claimed. Therefore, although the electromagnetic wave absorbing device (60) of Sawada may include a plurality of resonant circuit elements (e.g., dipole antennas 62) configured for intercepting electromagnetic energy, the resonant circuit elements do not function as presently claimed, and therefore, cannot be relied upon to provide such teaching. As such, none of the cited art provides teaching or suggestion for the apparatus, as recited in present claim 1.

Second, Applicants assert that the teachings of Sawada cannot be combined with those of Hui to overcome the deficiencies therein. For example, the Examiner suggests that the electromagnetic wave absorbing device (60) of Sawada can be combined with the pair of antennas (e.g., antennas 920 and 1010) disclosed by Hui to reduce EMI by absorbing the electromagnetic waves radiated between the pair of antennas (see, Office Action, pages 2-3). However, if such a combination were made, the mobile communication device of Hui would not function as presently claimed.

For instance, the primary objective of Hui is to provide multiple communication services within a single mobile communication device by combining two or more antennas that operate, for example, at different carrier frequencies (see, Hui, paragraphs [0008] to [0016]). A firewall (e.g., a conductive trace) is formed between the two antennas to reduce mutual coupling between the pair of antennas (see, Hui, paragraph [0069]). Hui fails to disclose exactly how the firewall may be used to reduce mutual antenna coupling. However, it seems likely that the firewall may reduce EMI by absorbing the electromagnetic energy, which couples into the receiving antenna through the conductive paths of the printed circuit board (PCB).

Now, let's assume that the firewall of Hui is replaced by the electromagnetic wave absorbing device of Sawada. If the electromagnetic wave absorbing device of Sawada is positioned between a pair of antennas, as suggested by Hui, the electromagnetic wave absorbing device would intercept the electromagnetic waves radiated from a first antenna, resonate the

intercepted wave to induce a high frequency current, and pass the high frequency current through a resistor to dissipate the current as thermal heat. In this manner, the electromagnetic wave absorbing device of Sawada would completely absorb the intercepted electromagnetic wave before it reaches the second antenna. By absorbing the radiated electromagnetic energy, the electromagnetic wave absorbing device functions to attenuate the transmitted signal and decrease the power efficiency of the transmitting antenna.

Unlike Hui and Sawada, the presently claimed apparatus includes a plurality of resonant circuit elements, which are specifically configured for redirecting – instead of absorbing – the intercepted electromagnetic wave. This allows the apparatus to reduce EMI between a pair of antennas without attenuating the transmitted signal or decreasing the power efficiency of the transmitting antenna (see, e.g., Specification, page 38, line 24 to page 39, line 17). Neither Hui nor Sawada provides an apparatus, which is capable of redirecting an intercepted electromagnetic wave. Therefore, even if Sawada were combined with Hui as suggested by the Examiner, the combined teachings of the cited art would still fail to provide teaching or suggestion for the apparatus, as specifically recited in present claim 1.

**In addition to lack of teaching or suggestion, Hui and Sawada provide no motivation that would enable one skilled in the art to modify the teachings of Hui and/or Sawada to produce the presently claimed apparatus.** As noted above, Hui and Sawada each fail to provide teaching or suggestion for the presently claimed apparatus, and furthermore, cannot be combined to do so. As set forth below, the cited art also fails to provide any motivation that would enable one skilled in the art to perform the necessary modification.

First of all, Hui and Sawada provide means for reducing EMI by absorbing electromagnetic energy, but fail to suggest even the slightest desirability for reducing EMI by any other means (e.g., by redirecting the EM energy, instead of absorbing it). The mere fact that references can be combined or modified does not render the resultant combination [or modification] obvious unless the prior art also suggests the desirability of the combination [or modification]. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); MPEP 2143.01. Without the necessary teaching, suggestion or desirability to do so, Applicants assert that Hui and Sawada cannot be modified to provide an apparatus, which reduces EMI by redirecting electromagnetic energy away from a receiving antenna.

Second, at least one of the cited art references (e.g., Sawada) would be rendered unsatisfactory for its intended purpose, if the proposed modifications were made. For example, the intent of Sawada is to eliminate harmful EMI generated by a source, so that nearby circuitry and/or a user of an electronic device will be unaffected by the EMI. Sawada achieves this intent by mounting an electromagnetic wave absorbing device onto the source responsible for generating the harmful electromagnetic energy. The electromagnetic wave absorbing device is configured for "absorbing the electromagnetic wave... in the device setting environment to attenuate the electromagnetic wave," or in other words, to make the electromagnetic wave disappear. See, Sawada, column 5, lines 10-51. If the apparatus of Sawada (i.e., the electromagnetic wave absorbing device) were modified to redirect – rather than absorb – the electromagnetic wave, the apparatus of Sawada would not be able to eliminate the harmful EMI generated by the source. In other words, the proposed modifications would render the modified apparatus of Sawada unsatisfactory for its intended purpose. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

For at least the reasons set forth above, Hui and Sawada each fail to teach, suggest or provide motivation for all limitations recited in independent claim 1. In addition, Hui and Sawada cannot be combined or modified to provide teaching or suggestion for the present claim limitations. Therefore, claim 1 and all claims dependent therefrom are patentably distinct over the cited art. Accordingly, removal this rejection is respectfully requested.

### **CONCLUSION**

The present amendment is believed to be a complete response to the issues raised in the Office Action mailed January 12, 2006. In view of the remarks herein, Applicant asserts that pending claims 1-15 are in condition for allowance. If the Examiner has any questions, comments or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Daffer McDaniel, LLP Deposit Account No. 50-3268.

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Date: April 11, 2006  
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